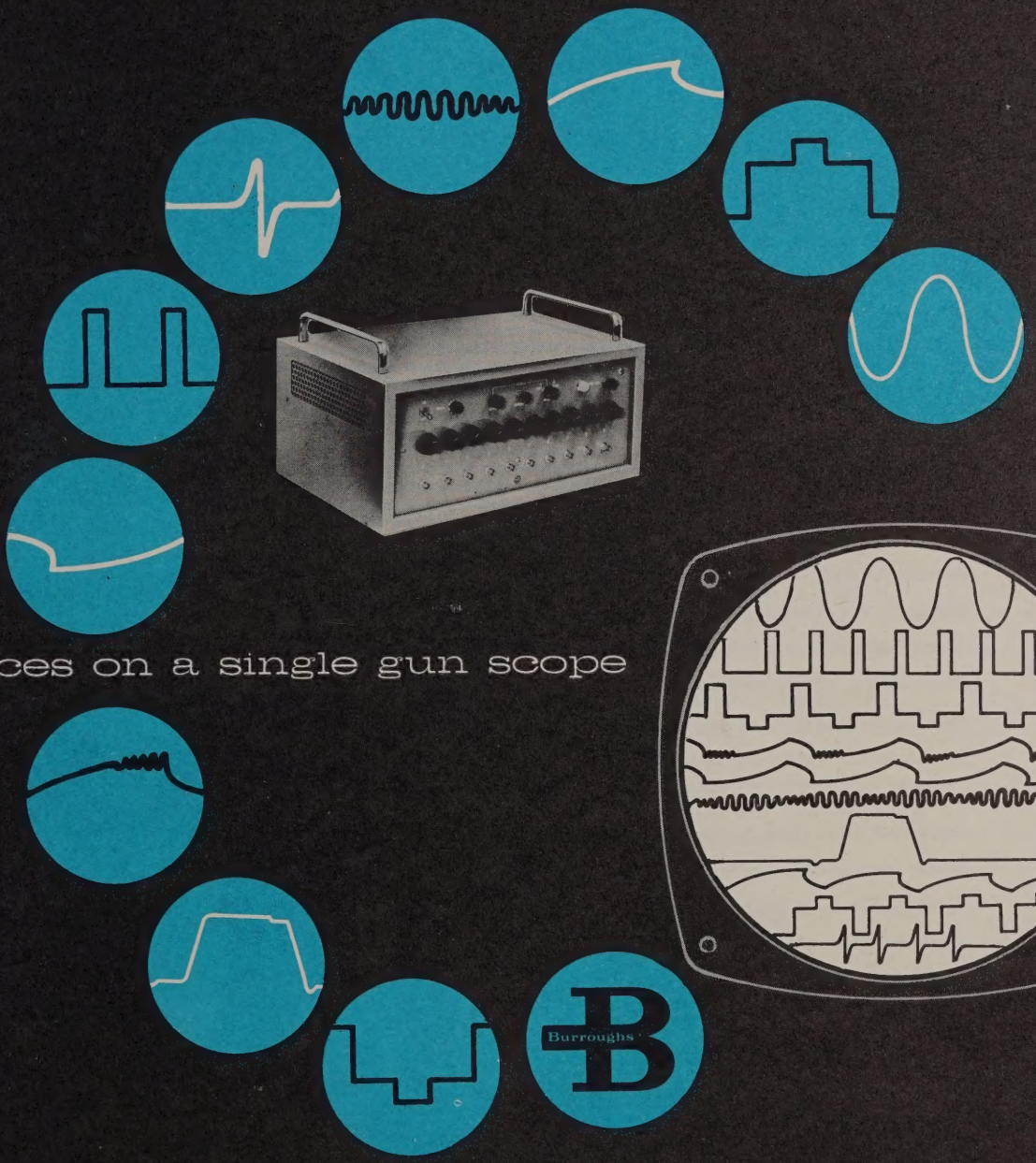
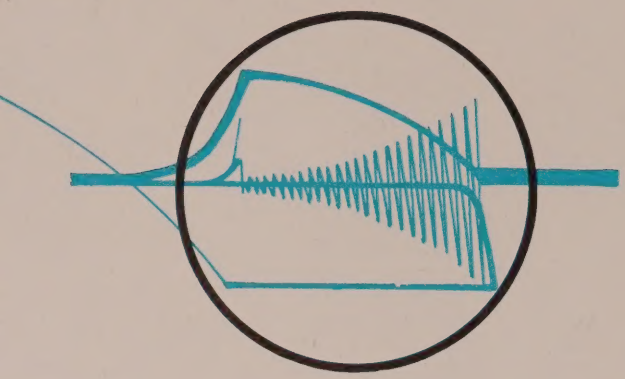
THE BEAMPLEXER



ten traces on a single gun scope

Burroughs



THE BEAMPLEXER

The Beamplexer is a ten position electronic switch utilizing the Burroughs Beam Switching Tube. It provides a means of displaying up to ten separate channels of information on a conventional single-beam oscilloscope. Individual controls on each of the ten input channels allow the vertical positioning of the signals, so that they may be superimposed on each other or placed in any desired relationship. This direct visual comparison simplifies certain studies and measurements of waveshapes, phase relationships, amplitude and frequency, and increases the application and effectiveness of the oscilloscope. Available as a rack mounting unit or in an individual cabinet, the Beamplexer is a portable instrument containing its own regulated power supply. It can be used with any standard oscilloscope and will find wide application with that instrument wherever multiple switching and time sharing techniques can be employed.

OPERATION

power

The unit is equipped with a self-contained regulated power supply whi

input

Switching Input: The switching section consists of a Schmitt circuit v switching pulse. This circuit is triggered on the positive going slope o between 5 volts and 50 volts. A two position switch on the front panel for the switching input. The output of the Schmitt circuit goes to:

A. The Trigger Out jack where it is used as a synchronizing
B. To the switching grids of the Beam Tube.

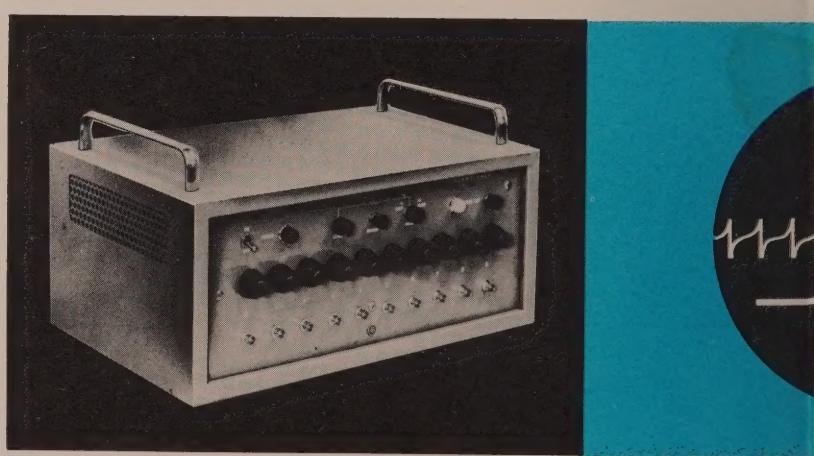
Data Input: Each of the channels is A. C. coupled to an individual pedestal level control in its grid circuit.

switching

The cathode of each of the triode amplifiers is connected to a corr through its ten positions, current is supplied to the tube connected to this way only one tube at a time is allowed to conduct.

output

The triode amplifiers are tied to a common plate load resistor. The ou and is available through a BNC connector at the rear of the unit.



The Beamplexer—Type 6001.
Shown with case—Type 7004.

Measu
Amplitu
time and

EFFECTIVE—MAY 1, 1959

INSTRUMENTS

PRICE SCHEDULE B 97

BEAMPLEXERS

6001	Beamplexer	$ 575.00
6001/7004	Beamplexer with Panel Cabinet	595.00

PULSE CONTROL UNITS

1003	Triple Push Button Generator	$ 192.00
1006	P.B. Wide Range Pulse Generator	200.00
1020	Pulse Standardizer	190.00
1050	10.4 Pulse Generator	325.00
1101	Flip Flop	170.00
1105	Twin Flip Flop	250.00
1201	Twin Coincidence Detector (Tube Type)	196.00
1202	Twin Coincidence Detector (Xtal Type)	90.00
1301	Pulse Delay (Multivibrator)	200.00
1302	Pulse Delay (Tapped Delay Line)	252.00
1303	Pulse Delay (.1 us. Not Panel Mounted)	35.00
1402	Gated Channel Selector	234.00
1501	Pulse Gater	203.00
1601	Crystal Mixer (Not Panel Mounted)	38.00
1602	Panel Mounted Twin Crystal Mixer	85.00
1603	Twin Vacuum Tube Mixer	250.00
1703	2-4-8-10-16 Pulse Counter	265.00
1751	Variable Scale Counter (1 Mc)	395.00
1801	Twin Pulse Operated Relay	250.00
1810	Voltage Calibrator	327.00
1901	Twin Inverter	250.00
1950	Sequence Gater	200.00
3003	Negative Current Driver	450.00
3004	Positive Current Driver	450.00

RACK EQUIPMENT

7001	Unwired 6 Ft. Rack on Casters	$ 30.00
7002	Wired 6 Ft. Rack on Casters	175.00
7003	Bench Rack	45.00
7004	7" Panel Cabinet	35.00
7101	Rack Power Strip with Amphenol Connectors	75.00
7102	Rack Power Strip with Jones Connectors	75.00
7202	Rack Power Control with Cut Out	275.00

POWER SUPPLIES

9001	8 Voltage Cabinet Type Power Supply	$6,950.00
9102	7 Voltage Rack Mounted Power Supply	1,750.00
9202	Power Supply (5 unit capacity)	375.00
9802	Power Supply for Type 1050	165.00

ACCESSORIES

8001	BNC Plug with Terminating Resistor	$ 3.00
8002	BNC Plug with Binding Post	3.00
8003	Bracket Mounted Jack with Flexible Lead	3.00
8004	Identification Card Holder	.55
8005	BNC Jack with Banana Plugs	3.00
8006	UG-274-U Tee Connector	4.50
8007	Straight-Through BNC Cable Connector	2.50
8010-8	8-Inch Cable with Two BNC Plugs	5.50
8010-24	2-Foot Cable with Two BNC Plugs	5.50
8010-48	4-Foot Cable with Two BNC Plugs	5.50
8010-84	7-Foot Cable with Two BNC Plugs	7.50
8010-120	10-Foot Cable with Two BNC Plugs	7.50
8010-180	15-Foot Cable with Two BNC Plugs	7.50
8101	Feed Through Panel	95.00
8201	Remote Indicator Panel	80.00
8020	3½" Blank Panel	2.50
8030	Rack Table Assembly	20.00
8040	Core Test Jig—A	35.00
8041	Core Test Jig—B	35.00
8008	Cable Adapter Jones Socket to Amphenol Plug	10.00
8009	Cable Adapter Amphenol Socket to Jones Plug	10.00
8012	10 Watt Terminator	8.50

SPECIAL INSTRUMENTS

TS204A	Optimeter (with Nixie Readout)	$1,950.00
TS204B	Optimeter (with Provision for Relay Readout)	1,950.00
TS204AP	Power Supply for Optimeter TS204A	360.00
TS204BP	Power Supply for Optimeter TS204B	360.00
RR40	Relay Readout (For Optimeter TS204B)	900.00
BCT301	Tape Wound Bobbin Core Tester	4,162.50
PG401	10.4 Mc Pulse Generator with Power Supply	525.00

DECADE COUNTERS and SPECIAL PRODUCTS

DECADE COUNTERS

			1-9	10-99	100 or More
DC-101	10 KC	only Nixie Readout	$ 85.00	$ 80.00	$ 75.00
DC-102	100 KC	only Nixie Readout	95.00	90.00	85.00
DC-103	1.1 MC	only Nixie Readout	125.00	115.00	105.00
DC-105	1.1 MC	Nixie & 10 outputs—Reset < 1 usec.	145.00	125.00	110.00
DC-105B	1.1 MC	Nixie & 10 outputs—Reset < 10 usec.	145.00	125.00	110.00
DC-106A	110 KC	Nixie & 10 outputs—Reset < 10 usec.	95.00	90.00	85.00
DC-106B	110 KC	10 outputs only—Remote Nixie Operation 400v	85.00	80.00	75.00
DC-106CA	110 KC	10 outputs only—Remote Nixie Operation 300v	85.00	80.00	75.00

ACCESSORIES:

Receptacles, type:	Used with:	1-99
SR-101	DC-105, DC-106	$3.00
SR-102	DC-101, DC-102 and DC-103	3.00

SIX DECADE TRAY (19-inch wide with receptacles for rack mounting)

R-201	Unwired with SR-102 receptacles	$32.00
R-202	Unwired with SR-101 receptacles	32.00
R-203	Wired—all DC-101	63.00
R-204	Wired—DC-103, DC-102, DC-101	63.00
R-205	Wired—all DC-106, DC-105B	63.00

CHEN COUNTERS

		1-9	10-99	100 & up
DC-190	10 KC Divider	$ 45.00	$ 42.00	$ 39.50
DC-191	100 KC Divider	55.00	47.50	45.00
DC-195	Time Base (consists of four DC-190, one DC-191 and one BU-200)	249.50	240.00	230.00

Accessories

		1-9	10-99	100 & up
BU-200	Output Buffer Amplifier	35.00	32.50	30.00
BU-201	Input Buffer Amplifier		Prices on request	
OS-100	100 KC Transistorized Oscillator		Prices on request	

LENTICULAR OPTIC DISPLAYS

		1-99
LD-22	Up to 16 messages (2½" x 2½" screen)	$45.00
LD-35	Up to 20 messages (3" x 5" screen)	$55.00

NOTE 1: An initial tooling charge of $5.00 per message is added to the basic cost of the first unit ordered. Additional units containing the same messages are priced as indicated above. The tooling charge covers the costs of preparation and photography and is charged only once for any given message. Therefore once a specific message has been prepared it can be used in combination with any other messages without additional cost.

NOTE 2: Units can be supplied for evaluation purposes containing typical messages, digits, etc. at no extra cost.

NOTE 3: Duplicate lenses are available at the following prices: type LD-22, $17.00; type LD-35, $20.00.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.
MINIMUM ORDER $10.00.
ALL PRICES F.O.B. SHIPPING POINT, NET 30 DAYS.

WARRANTY

Instruments are warranted to be free from defects caused by materials, workmanship, and construction for a period of 180 days from the date of shipment. Burroughs Corporation's Liability under this warranty is limited to replacing or repairing any instrument returned by the buyer during such period, provided:

1. Buyer promptly notifies Electronic Tube Division, Burroughs Corp., Plainfield, New Jersey in writing requesting authorization to return the unit as per our warranty policy. Letters should itemize complaints.
2. The defective unit is returned to address in (1), transportation charges prepaid.
3. Manufacturer's examination shall disclose to its satisfaction that defects have not been caused by misuse, neglect, accident or improper installation.

Under no conditions shall Burroughs Corp. be liable for collateral or consequential damages. This warranty is in lieu of all other warranties expressed or implied.

ELECTRONIC CONTRIBUTIONS BY

Burroughs Corporation

ELECTRONIC TUBE DIVISION

Plainfield, New Jersey

REPRESENTED BY:

Data Report 2000
April 6, 1961

Burroughs Corporation

ELECTRONIC COMPONENTS DIVISION
PLAINFIELD, NEW JERSEY

DC/DC CONVERTER, TYPES VC12-170 AND VC28-170

Preliminary Engineering Data

DESCRIPTION: The Burroughs DC/DC Converter Modules, types VC12-170 and VC28-170, accept 12 VDC and 28 VDC, respectively, and provide a 170 VDC output suitable for operating NIXIE® Indicator Tubes. The converter is intended for use in electronic equipment where a high level DC voltage is not available. These units, when used in conjunction with the TRIXIE® Modules (transistor drivers for NIXIE tubes) provide a perfect combination for use in fully transistorized systems.

MODE OF OPERATION: The voltage level conversion is obtained by means of a transistor oscillator, transformer, and rectifier technique.

ELECTRICAL CHARACTERISTICS:

Input Ratings	VC12-170	VC28-170
Voltage	12 volts ± 5%	28 volts ± 5%
Current	750 ma max. (at full load)	300 ma max. (at full load)

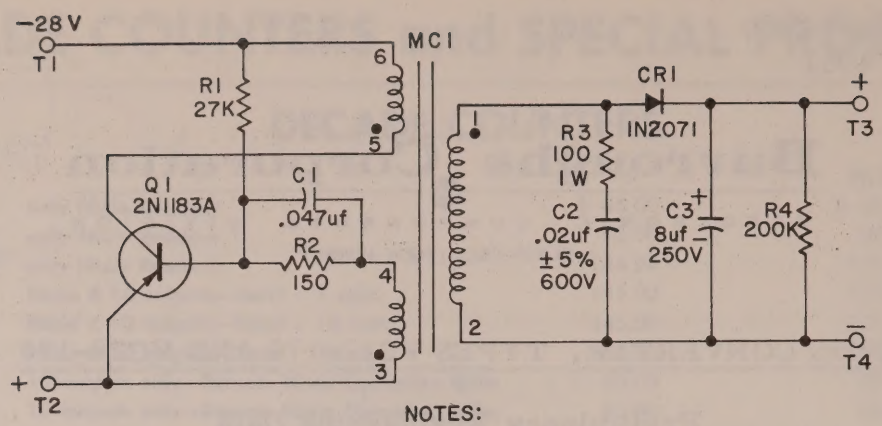
Output Ratings	VC12-170	VC28-170
Voltage, full load	170 VDC, min.	170 VDC, min.
Voltage, no load	200 VDC ± 5%	200 VDC ± 5%
Current, full load	30 ma	30 ma
Impedance	330 ohms nom.	600 ohms nom.
Ripple	4V pp max, (at full load)	4V pp max, (at full load)

TERMINAL ARRANGEMENT

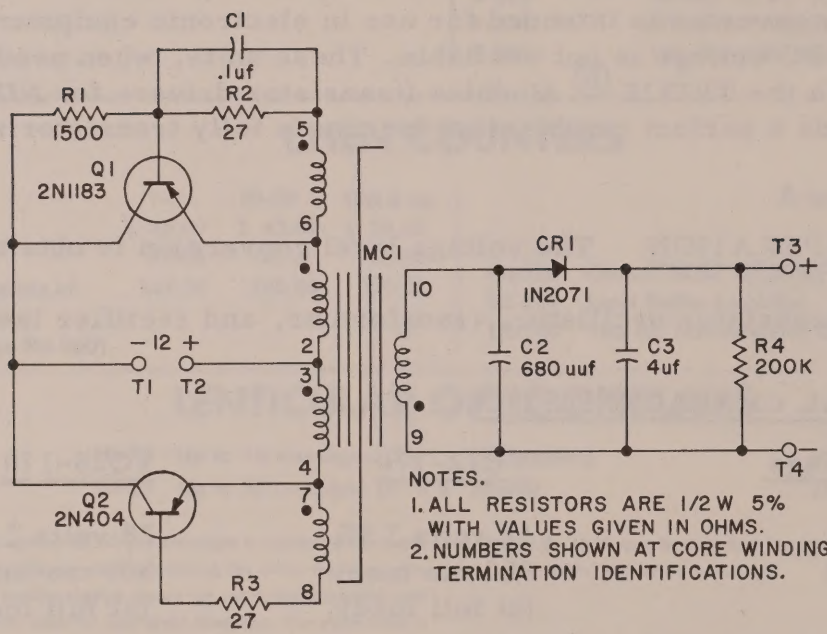
Input	Pins 1 and 2 (Pin 2 positive)
	Pins 3 and 4 (Pin 3 positive)

PRICING

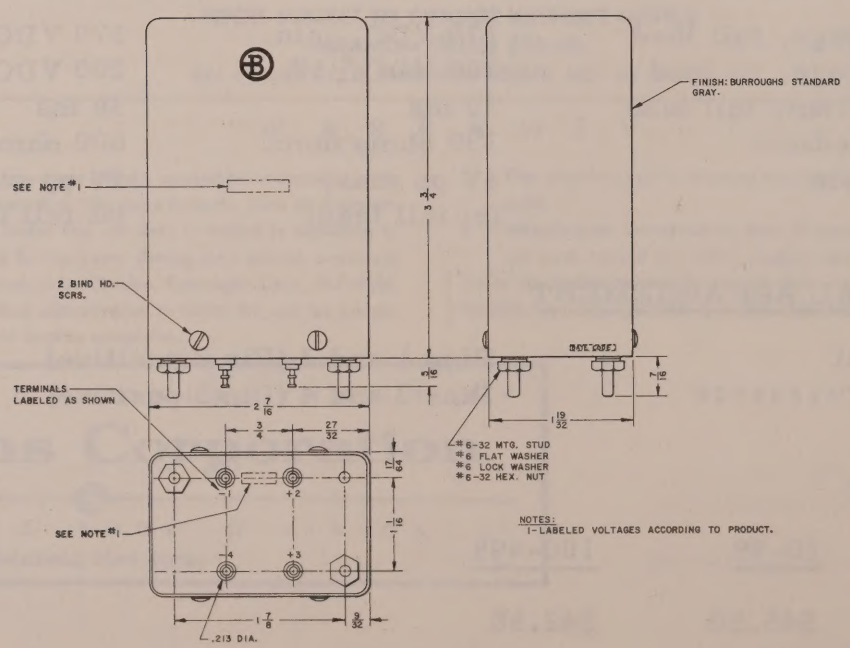
1-9	10-99	100-499
$48.50	$45.50	$42.50



NOTES:
1. EXCEPT AS NOTED ALL RESISTORS 1/2 W±5% WITH VALUES GIVEN IN OHMS.
2. NUMBERS SHOWN AT CORE WINDING ARE TERMINATION IDENTIFICATIONS.



NOTES.
1. ALL RESISTORS ARE 1/2 W 5% WITH VALUES GIVEN IN OHMS.
2. NUMBERS SHOWN AT CORE WINDINGS ARE TERMINATION IDENTIFICATIONS.



Applications Notes: The voltage converters can be used with any of the NIXIE indicator tubes having a maximum ionization voltage rating of 170 volts or less. Since the output voltage of the converter decreases about 1 volt for each 1 ma of load current, the size of the current limiting anode resistance used with each NIXIE tube will depend on the number and type of NIXIE tubes being supplied. The size of the appropriate anode resistance for the NIXIE tube is determined as follows.

The nominal load current (I_N) to be supplied by the converter is obtained by multiplying the number (N) of NIXIE tubes to be supplied by the average current (I_A) for the type of NIXIE tube being used. The average NIXIE tube current is determined by adding together the minimum and maximum test currents for the NIXIE tube type as specified in the NIXIE tube catalogue and by then dividing the sum by two as follows:

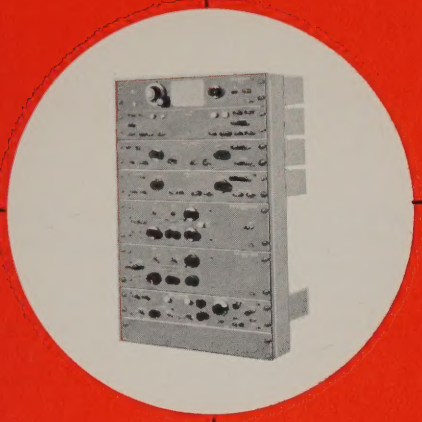
$$I_A = \frac{I_{max} + I_{min}}{2}$$

For the type B6033 average current is $2\frac{1}{4}$ ma ($\frac{3.0 + 1.5}{2} = \frac{4.5}{2} = 2\frac{1}{4}$)

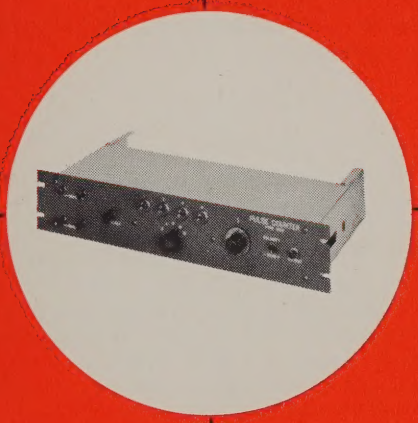
Thus, if eight (8) type B6033's are to be operated from the converter, the nominal load current would be 18 ma (8 x $2\frac{1}{4}$). The converter output voltage (V_o) would then be 182VDC (200 - 18).

The NIXIE tube catalogue specifies the amount of current limiting series resistance to be used with a given type of NIXIE tube when a supply voltage of 170 VDC is used. Where the supply voltage is greater than 170 VDC, the series resistance should be increased so that the average current through the NIXIE tube will not change. Thus, if the converter output voltage (V_o) is 182VEC, the series resistance used with each NIXIE tube would be increased enough to provide an additional 12VDC (182-170) voltage drop across the series resistance. For type B6033 NIXIE tubes with an average current of $2\frac{1}{4}$ ma, the additional series resistance required would be about 5000 ohms. Since the series resistance specified for the B6033 at 170 VDC is 43 K ohms, the series resistance required with a voltage of 182VDC applied would be 48 K ohms.

SUMMARY: The converter output voltage decreases by about 1VDC for each 1 ma of load current. The series resistance required for each NIXIE tube being supplied will depend on the number and type of NIXIE tube being used.



BURROUGHS UNITIZED PULSE CONTROL INSTRUMENTS



ANOTHER ELECTRONIC CONTRIBUTION BY

Burroughs Corporation

ELECTRONIC TUBE DIVISION

Plainfield, New Jersey

EVERY ENGINEER WHO WORKS WITH PULSES SHOULD KNOW ABOUT BURROUGHS PULSE CONTROL EQUIPMENT

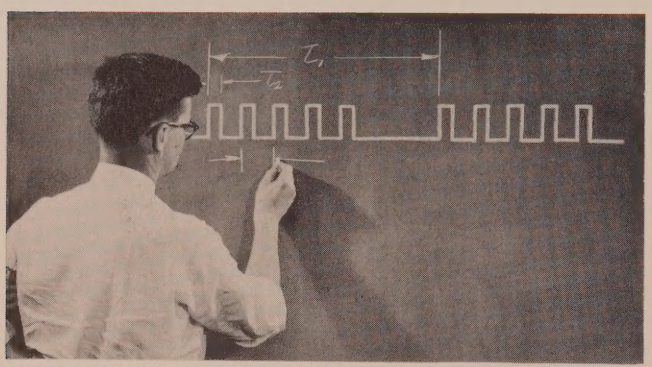
New packaged pulse handling units performing basic functions connect together to form a virtually unlimited variety of pulse systems.

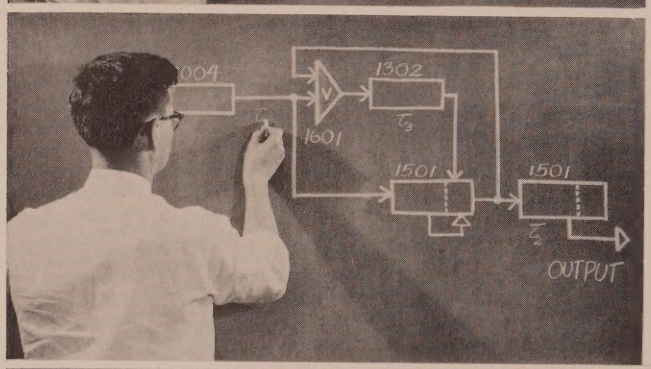
Now you can assemble any kind of pulse system you need from the simplest to the most complex — usually in a matter of minutes. All you do is connect together Burroughs Pulse Units, using standard plug-in cables.

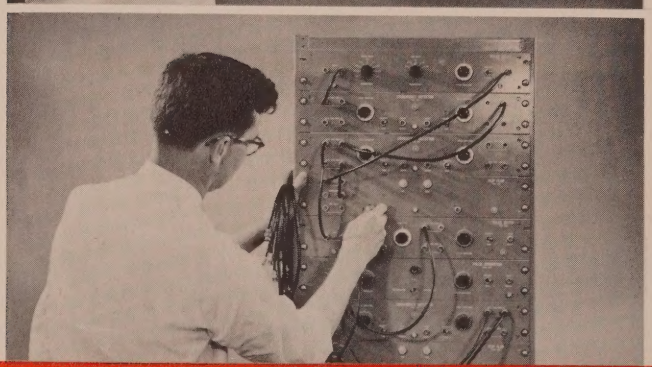
Speed of set-up is one of the chief advantages of this equipment. There's no soldering required. Systems can be set up or radically changed without tools.

Since Burroughs Pulse Units are complete within themselves and matched to each other, you're relieved of the problem of detailed circuit design. You work with simple block diagrams and basic ideas only . . . concentrate your efforts entirely on the logic of the system.

BURROUGHS PULSE TEST UNITS HELP ENGINEERS SAVE TIME TO DO MORE







1. STUDY THE PULSE SEQUENCE

This is the time chart of the desired pulse output from the pulse system. It shows pulse height, pulse width, pulse frequency, and pulse separation. Usually, the pulse sequence is worked out as part of your preliminary planning prior to beginning actual engineering with the equipment.

2. DRAW THE BLOCK DIAGRAM

This is the first step in planning the actual pulse system. Using standard block diagram symbols, you can plan your complete system within a matter of minutes. And you needn't worry about circuit details within the units themselves, because all units are complete and matched to each other.

3. CONNECT THE UNITS TOGETHER

From the block diagram you can determine which Burroughs units you need in your rack. Connect them together with standard cables, and there's your pulse system. Convenient front-panel controls add further flexibility — enable you to make frequency changes over a wide range as easily as turning knobs.

INDIVIDUAL UNITS CONNECT TOGETHER TO PERFORM THE FOLLOWING BASIC FUNCTIONS: PULSE GENERATING, GATING, DELAYING, MIXING, SAMPLING, STORING, COUNTING, DISTRIBUTING, AND SEQUENCING.

Typical Applications For Burroughs Pulse Units

Pulses are being used so widely today that it would be impossible to list fully the many fields of application for Burroughs Pulse Units. Generally, however, they are being used in research, development, and production testing in connection with such applications as:

RADAR
COMPUTERS
TELEVISION
INSTRUMENT DESIGN
SYSTEM DESIGN
INDUSTRIAL CONTROL
TELEMETERING

ELECTRONIC CONTROL
TEST EQUIPMENT
BEAM SWITCHING TUBE TESTING
TRANSISTOR TESTING
CORE TESTING
MISSILE INSTRUMENTATION
RELAY TESTING

If you have an engineering problem involving pulses, write Burroughs. Without charge, we'll engineer a system for you showing which Burroughs Pulse Units you need and how much you can save in engineering time and equipment cost. Deliveries can usually be made immediately from stock.

TRY NEW IDEAS — Burroughs Pulse Units are so easy to use they make it possible for you to try many new ideas that you might otherwise never find time for. Think of it. No breadboard engineering. No designing special test equipment before you begin on a new project. Consider how many more new ideas you can try when you have this convenient, flexible equipment at your finger tips. If you work with pulses, you need these new engineering tools.

CORRECT ERRORS FAST — Before Burroughs Pulse Units were developed, errors in pulse system planning meant a serious economic loss — in equipment as well as time. Not so now. When you discover an error in planning your system, simply reconnect the cables and correct the error. It only takes minutes. Often you can't be sure how a system should be connected. With Burroughs units, you can try different ways — at no loss. You can experiment without losing engineering time.

SPEED COMPLETION OF ENGINEERING — Every day lost in the engineering phase of product development postpones product delivery. So you're the loser when you take time to build your own test equipment. How much easier it is to make deadlines when you can simply connect Burroughs pre-engineered units together. Leading laboratories engaged in all phases of electronics research are now benefiting from the time-saving advantages of Burroughs Pulse Units.

USE EQUIPMENT OVER AND OVER AGAIN — This is where the real economy comes in. But first let us say a word about original cost. Burroughs Pulse Units usually cost less than you would otherwise have to spend in engineering time and equipment to design and build your own pulse system. Beyond that, they can be used over and over again on different future jobs — saving additional cost in every application. The total savings can be incalculable.

1003 TRIPLE PUSH BUTTON PULSE GENERATOR

Inputs:
(a) Push Button
(b) Push button and a positive synchronizing pulse
(c) Low frequency — limited pulse shaper for standardizing to 0.1 μsec. pulse)

Output:
Duration: 0.1 μsec. half sine wave pulse
Amplitude: variable from 0 to 35 volts
Polarity: positive only
Impedance: 93 ohms

TRIPLE PUSH BUTTON

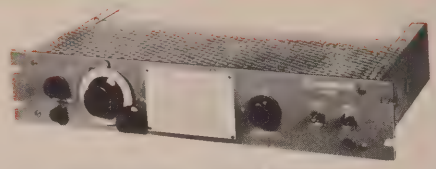
1003

1006 WIDE FREQUENCY RANGE PULSE GENERATOR

Inputs:
(a) Push Button
(b) Free-running: Frequency continuously variable from 15 cps to 4.5 MC

NEW

Output:
Duration: 0.1 μsec. half sine wave pulse
Amplitude: variable from 8 to 30 volts
Polarity: Positive or negative
Impedance: 93 ohms



WIDE FREQUENCY RANGE PUSH BUTTON TO 4.5 MC

1006

1020 PULSE STANDARDIZER

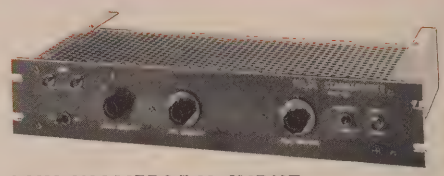
Input:

ac or dc sine wave pulse	5 volts min. 40 volts max. peak-to-peak positive — 30 volts max. negative — 20 volts max.
dc	positive — 30 volts max. negative — 15 volts max.

NEW

repetition frequency — to 1 megacycle

Output:
Duration: 0.1 μsec. half sine wave pulse
Amplitude: variable 8 to 30 volts
Polarity: Positive or negative
Impedance: 93 ohms



ANY WAVEFORM INPUT CONTROLLABLE STANDARDIZED OUTPUT

1020

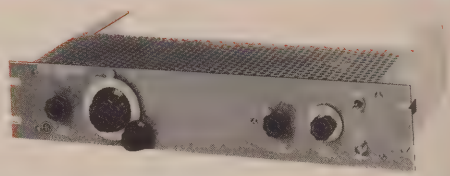
1050 HIGH FREQUENCY PULSE GENERATOR

Inputs:
(a) Free-running: Frequency continuously variable from 1.6 MC to 10.4 MC

NEW

Output:
Pulse Widths: 30, 40, 50, 60 or 70 millimicroseconds half sine wave pulse
Amplitude: variable 1 to 30 volts
Polarity: Positive or negative
Impedance: 93 ohms

Also available as a complete instrument. See PG-401



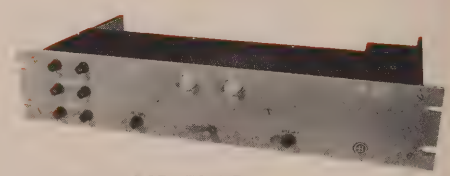
HIGH FREQUENCY 1.6 MC TO ABOVE TEN MEGACYCLES

1050

1101 HIGH FREQUENCY FLIP-FLOP

Inputs:
Positive 0.1 μsec. pulse
15.0 volt minimum amplitude
2.5 MC. maximum frequency
Zero: A pulse into this jack sets the flip-flop to the "zero" state
One: A pulse into this jack sets the flip-flop to the "one" state
Complement A pulse into this jack reverses the flip-flop

Outputs:
Zero Gate: —23 or '0' volts dc
One Gate: '0' or —23 volts dc
(when zero gate = —23V, one gate = 0V and vice-versa)
Rise Time: 0.06 μsec. (unloaded)
Fall Time: 0.06 μsec. (unloaded)



2.5 MC FLIP FLOP

1101

1105 TWIN FLIP-FLOP

Inputs: (each half)
Positive 0.1 μsec. pulse
15 volt minimum amplitude
1.0 MC maximum frequency
Zero: A pulse into this jack sets the flip-flop to the "zero" state
One: A pulse into this jack sets the flip-flop to the "one" state
Complement A pulse into this jack reverses the flip-flop

Outputs: (each half)
(a) Zero Gate: —23 or '0' volts dc
(b) One Gate: '0' or —23 volts dc when zero gate = —23 volts, one gate = 0 volts and vice-versa
Rise Time: 0.1 μsec. (unloaded)
Fall Time: 0.1 μsec. (unloaded)

TWIN FLIP FLOP

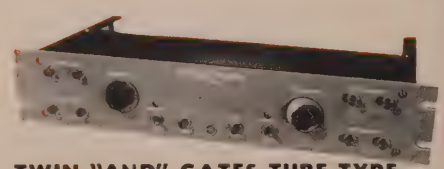
1105

1201 TWIN COINCIDENCE DETECTOR

(To sense coincidence between DC level "And" 0.1μsec. pulse)

Inputs: (each half)
Grid #1
Positive 0.1 μsec. pulse
13 volt minimum amplitude
2.5 MC. maximum frequency
Grid #3
'0' or —23 volts dc
to open or close grid #1

Outputs: (each half)
(obtained when grid #3 is '0' volts "And" grid #1 has 0.1 μsec. pulse)
Duration: 0.1 μsec. half sine wave pulse
Amplitude: Variable 10 to 30 volts
Polarity: Positive or negative
Impedance: 93 ohms



TWIN "AND" GATES TUBE TYPE

1201

1202 TWIN COINCIDENCE DETECTOR

(To sense coincidence of from two to five DC levels)

Inputs:
Two level dc voltages
'0' or —23 volts

Output:
'0' volts when all used inputs are '0'
—23 volts when one or more inputs are —23 volts

TWIN "AND" GATES XTAL TYPE

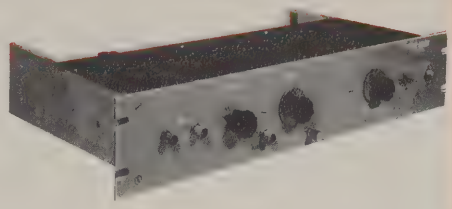
1202

1301 PULSE DELAY

(Multivibrator delay 1.0 to 80,000 μsec.)

Input:
Positive 0.1 μsec. half sine wave pulse
20 volt minimum amplitude

Outputs:
(a) 1 to 80,000 μsec. after input pulse
Duration: 0.1 μsec. half sine wave pulse
Amplitude: variable 10 to 30 volts
Polarity: Positive or negative
Impedance: 93 ohms
(b) Two level DC voltage:
Zero volts in quiescent state;
+30 volts during delay period
(1 to 80,000 μsec.)
Impedance: 1650 ohms



1 TO 80,000 USEC DELAY

1301

1302 PULSE DELAY

(Tapped delay line 0.1 to 1.9 μsec. in 0.05 μsec. steps)

Input:
Positive 0.1 μsec. pulse
13 volt minimum amplitude

Output:
(0.1 to 1.9 μsec. after input pulse)
Duration: 0.1 microsecond
Amplitude: Variable 10 to 32 volts
Polarity: Positive or negative
Impedance: 93. ohms

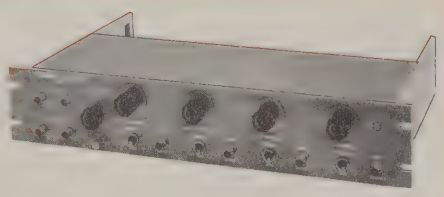
0.1 USEC TO 1.9 USEC DELAY

1302

1402 CHANNEL SELECTOR

Inputs:
Coincidence Inputs
Grid #1: Positive 0.1 μsec. pulse
10 volts minimum amplitude
2.5 MC. maximum frequency
Grid #2: Zero or —23 volts to open or close grid #1

Outputs: (Four)
Duration (each): 0.1 μsec. half sine wave
Amplitude (each): variable 10 to 30V
Polarity (each): Positive or negative
Impedance (each): 93 ohms



4 OUTPUTS FROM 1 INPUT

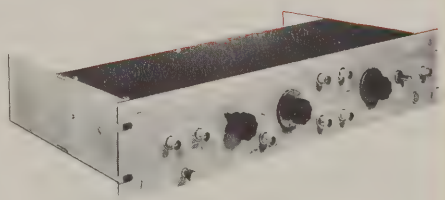
1402

1501 PULSE GATER

Accomplishes functions of a pulse delay, a flip-flop and a coincidence detector to gate pulses for a period variable from 0.3 to 6,000 μsec.

Inputs:
(a) Delay trigger input:
Positive 0.1 μsec. pulse
10 volts minimum amplitude
(b) Coincidence inputs:
Grid #1: Positive 0.1 μsec. pulse
20V minimum amplitude
Grid #3: Zero or —23 volts to open or close grid #1

Outputs:
(a) Gating output (DC level)
—30 volts in quiescent state
'0' volts during delay period
Delay Period: Variable from 0.3 μsec. to 6000.0 μsec.
(b) Pulse Output
During coincidence
Duration: 0.1 μsec. half sine wave pulse
Amplitude: Variable 10 to 32 volts
Polarity: Positive or negative
Impedance: 93 ohms



GATES PULSE "BURSTS"

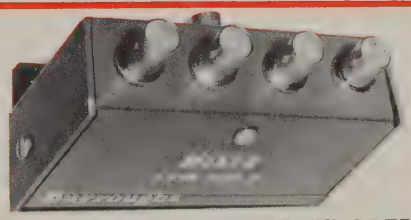
1501

1601 MIXER

(Non rack mounted)

Inputs: (4)
Positive 0.1 μsec. half sine wave pulse
20 volts minimum amplitude
2.0 MC. maximum frequency

Output:
(Do not terminate)
Duration: 0.1 μsec. half sine wave pulse
Amplitude: Input minus 1 db maximum
Polarity: Positive



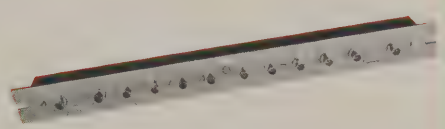
PULSE 4 INPUT "OR" GATE

1601

1602 TWIN MIXER

Inputs: (5 each half)
Positive 0.1 μsec. half sine wave pulse
20 volts minimum amplitude
2.0 MC. maximum frequency

Output: (one each half)
(Do not terminate)
Duration: 0.1 μsec. half sine wave pulse
Amplitude: Input minus 1 db maximum
Polarity: Positive



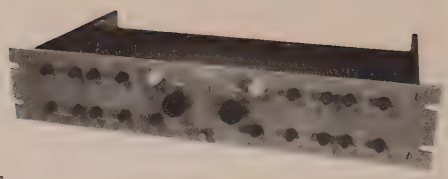
TWIN 5 INPUT PULSE "OR" GATE

1602

1603 TWIN MIXER
(Mixes the outputs of 4 flip-flops)

Inputs: (Four in each half)
Two level DC voltage
'0' or 23 volts

Output: (One for each half)
'0' volts DC if any or all inputs = '0' volts
—23 volts DC if all four inputs = — 23 dc



TWIN DC "OR"

1603

1703 PULSE COUNTER
Binary or Decade Scaler

Inputs:
(a) Counting (1.0 MC. maximum frequency)
0.1 μsec. positive pulse
15 volts minimum amplitude
(b) Electronic reset
0.1 μsec. positive pulse
15 volts minimum amplitude
reset time — 2.2 μsec.
(c) Push button reset

Output: After selected 2, 4, 8, 10 or 16 count
Width: 0.1 μsec. half sine wave
Amplitude: Variable 0 to 30 volts
Polarity: Positive or negative
Impedance: 93 ohms

NEW

COUNTS BY 2, 4, 8, 10, OR 16

1703

1751 VARIABLE SCALE COUNTER

Inputs:
(a) Counting (1 MC maximum frequency)
0.1 μsec. positive pulse
25 volts minimum amplitude
(b) Electronic reset
0.1 μsec. positive pulse
25 volts minimum amplitude
Reset time — 1.0 μsec.
(c) Push button reset

Outputs:
(a) After selected 1 thru 10 count
0.1 μsec. positive or negative pulse
Amplitude: Variable 0 to 30 volts
(b) During each count period
One ON position = —90 volts
Nine OFF positions = —60 volts

NEW

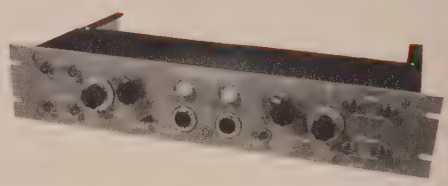
ALL 10 OUTPUTS AVAILABLE— UNITS MAY BE CASCADED

1751

1801 PULSE OPERATED RELAY

Inputs:
Mode I (flip-flop)
(a) Energize
Positive 0.1 μsec. half sine wave pulse
20 volts minimum amplitude
(b) De-energize
Positive 0.1 μsec. half sine wave pulse
20 volts minimum amplitude
Energize in-put triggers flip-flop, thereby energizing relay
De-energize in-put resets the flip-flop, thereby de-energizing relay.
Mode II (Univibrator)
(a) Energize
Positive 0.1 μsec. half sine wave pulse
20 volts minimum amplitude
Energize in-put triggers univibrator, thereby energizing relay.
Delay period of univibrator variable from 1 millisecond to 8 seconds.

Outputs:
(a) Normally open relay contacts
(b) Normally closed relay contacts

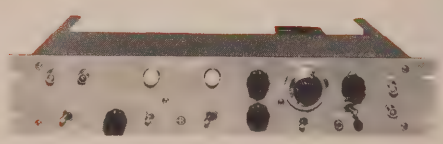


CONNECTS PULSE EQUIPMENT TO TERMINAL EQUIPMENT

1801

1810 PULSE CALIBRATOR

The 1810 Pulse Calibrator is used primarily to measure AC, DC or pulse voltage and current amplitudes with an overall accuracy better than 0.3%. It can also be employed to obtain a more accurate measurement of pulse width and rise time where these measurements are taken at a percentage of the peak amplitude of the unknown signal.



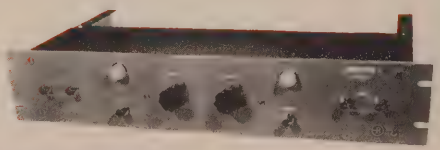
MEASURES AC, DC, OR PULSE WITH 0.3% ACCURACY

1810

1901 TWIN INVERTER

Inputs: (DC)
Zero or —23 volts

Outputs: (DC)
When input = 0 Volts Output = —23 Volts
When input = —23 Volts Output = 0 Volts



DC INVERTER

1901

1950 SEQUENCE GATER

This unit is used in conjunction with the 1750 pulse counter. It produces standard pulse control voltages to sequence 1201 or 1202 coincidence detectors.

Inputs: (10)
DC levels from 1750
—90 volts
—60 volts

Outputs: (10)
DC levels:
Zero volts when input = —90 volts
—30 volts when input = —60 volts

COMPANION TO 1750

1950

CURRENT DRIVERS TYPES 3003-3004

The types 3003 and 3004 operate as cascode amplifiers with the cathode-anode junction at ground potential. The 3003 which produces the negative pulses is designed as a high impedance, high current source. The 3004 produces the positive current pulses and is designed for low impedance operation. It functions as a cathode follower.

Input — Standard 0.1 microsecond negative pulses of approximately 15 to 30 volts amplitude.

Output — Rectangular current pulses of variable amplitude, rise time and duration.

The type 3003 produces negative pulses, and the type 3004 produces positive pulses both with respect to ground.

Controls

Duration — Coarse and fine controls produce pulse widths continuously variable from 1.0 to 10 microseconds.

Rise Time — Coarse and fine controls allow continuous adjustment over rise times between 0.2 and 1.0 microseconds. Rise time is linear.

Fall Time — Fixed at 0.3 microseconds.

Amplitude — Coarse and fine controls permit continuous control up to 1.0 ampere.

Power Requirements

3004	
+150 VDC	80 ma
−150 VDC	46 ma
6.3 VAC	9.15 amps
3003	
−150 VDC	38 ma
−400 VDC	46 ma
6.3 VAC	11.65 amps

Duty Factor — 10%

Stability — If set according to instructions after proper warm up, the current pulse should remain stable for 24 hours.

HIGH CURRENT CORE TESTER

3003
3004

BCT-301 CORE TESTING SYSTEM

The BCT-301 is a complete core testing system composed of Burroughs Pulse Control units and designed expressly for the individual testing of tape-wound bobbin cores. It provides precise control over the frequency, pattern, amplitude and rise time of the core driving signal. The BCT-301 also allows highly accurate measurements of the switching time of the core as well as the amplitude of the output pulse. Because of its flexible, unitized construction, the BCT-301 can be enlarged and modified to accommodate many core testing applications including the testing of completely assembled core devices.

TAPE WOUND BOBBIN CORE TESTING EQUIPMENT

The BC7-301 uses standard Pulse Control units plus the 3003/3004 Current Drives plus Core Holding Jig and Table

BCT
301

PG-401 HIGH FREQUENCY PULSE GENERATOR

The PG-401 is a complete 1.6 to 10.4 megacycle pulse generator instrument comprised of a model 1050 high frequency pulse generator, a 9802 power supply and a 7002 seven inch panel cabinet.

The PG-401 pulse generator has the following specifications:

I. Frequency: Continuously variable from 1.6 to 10.4 megacycles
II. Output: Half-sine wave pulse
  A. Amplitude: Continuously variable from 1 to 30 volts
  B. Duration: 30, 40, 50, 60 or 70 millimicroseconds
  C. Polarity: Positive or negative
  D. Impedance: 93 ohms

Since the unit will produce thirty volts into a ninety-three ohms load, it can also be used as a high frequency current driver.

NEW

1.6 TO 10.4 MEGACYCLE PULSE GENERATOR COMPLETE WITH POWER SUPPLY

PG
401

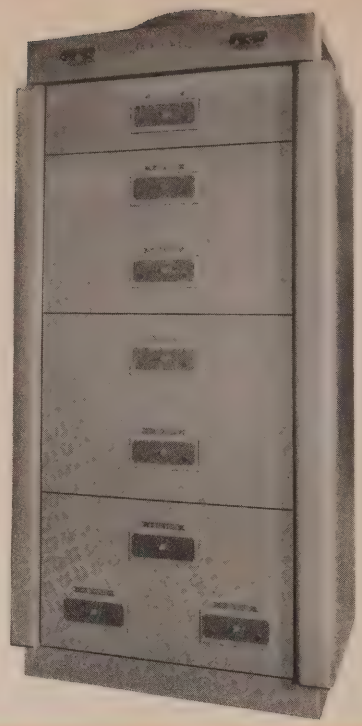
RACK EQUIPMENT

7001	Unwired 6 Ft. Rack on Casters	7101	Rack Power Strip with Amphenol Connectors
7002	Wired 6 Ft. Rack on Casters	7102	Rack Power Strip with Jones Connectors
7003	Bench Rack	7202	Rack Power Control with Cut-Out
7004	7" Panel Cabinet		

ACCESSORIES

8001	BNC Plug with Terminating Resistor	8010-48	4-Foot Cable with Two BNC Plugs
8002	BNC Plug with Binding Post	8010-84	7-Foot Cable with Two BNC Plugs
8003	Bracket Mounted Jack with Flexible Lead	8010-120	10-Foot Cable with Two BNC Plugs
8004	Identification Card Holder	8010-180	15-Foot Cable with Two BNC Plugs
8005	BNC Jack with Banana Plugs	8101	Feed Through Panel
8006	UG-274-U Tee Connector	8201	Remote Indicator Panel
8007	Straight-Through BNC Cable Connector	8020	3½" Blank Panel
8010-8	8-Inch Cable with Two BNC Plugs	8030	Rack Table Assembly
8010-24	2-Foot Cable with Two BNC Plugs		

POWER SUPPLIES



9001

The Type 9001, the largest composite power supply in the Burroughs line, provides eight regulated d-c voltages each supplied by an independent unit. All d-c voltages can be manually adjusted ±20% from the nominal voltage. With the exception of the —15 volt and the —35 volt units, which are mounted on the same panel, each unit may be removed separately for servicing. Since all units are electrically interlocked by relays, failure, such as the loss of d-c output from any unit or the opening of a central transformer primary fuse, will cause all d-c output voltages to be removed.

Power is made available by means of a terminal strip located inside the cabinet.

SPECIFICATIONS

Output — D-C Voltage / Current

D-C Voltage	Current
+400	1 amp.
+250	5
+150	6
+105	3
—15	1
—35	1
—150	6
—400	1

Input — 220 volts 60 Cycles Single Phase 42 amps.

Regulation — ±1% from 10% load variations, for a-c input line variations of ±8%.

Dimensions — The 9001 is mounted in a steel cabinet 35" wide x 75⅜" high x 22 1/16" deep.

Weight — 1600 lbs.

9102

The Type 9102 is a composite, regulated power supply providing seven separately controlled d-c voltages, each regulated to within 1% of its selected value. Since all units are electrically interlocked by relays, a failure in any of the output voltages will disconnect all d-c voltages. The entire unit is contained in one panel suitable for relay rack mounting, and power is made available through an Amphenol plug on either side of the unit. In addition, there are four independent 6.3 volt, 12.5 ampere heater windings available.

SPECIFICATIONS

Output — D-C Voltage / Current

D-C Voltage	Current
+250	500 ma
+150	500 ma
+105	500
—15	±25
—35	±25
—150	1.0 amp
—400	200
A-C Voltage	12.5 amp. (each source)
6.3 (four available)	

Input — 117 VAC 60 Cycle Single Phase 12 amps. Can be adapted for 220 VAC 60 Cycle Single Phase 3 wire use.

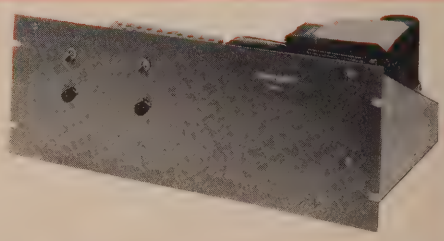
Regulation — ±1% from 10% load variations, for a-c input line variations of ±10%.

Ripple — Less than 0.05% RMS.

Size — 19" wide x 24" high x 8¾" deep.

Mounting — Rack mounted with amateur notching.

Weight — 75 lbs.



9202

The Type 9202 is the smallest in the line of Burroughs Power Supplies. It is a composite supply which provides six d-c voltages and will drive five individual Burroughs Pulse Control units. Because of its built-in socket connections which permit power distribution without the use of power rack strips, this unit can be used with the Burroughs Bench Rack, Type 7003, or any standard 19" relay rack.

SPECIFICATIONS

Output — D-C Voltage / Current

D-C Voltage	Current Min.	Current Max.
+250	2 ma	150 ma
+150	30	300
+105	9	180
—15	0	15
—150	135	180
—400	10	1·5
A-C Voltage		
6.3		Current 16 amp.

Input — 115 VAC 60 Cycle Single Phase

Regulation — For combined line variations of 110 to 120 VAC and indicated load variations there is ±5% regulation for all output voltages.

Ripple — Less than 0.5% RMS.

Size — 19" wide x 7" high x 14" deep.

Mounting — Rack mounted with Amateur notching.

Weight — 35 lbs.

Burroughs Corporation

ELECTRONIC TUBE DIVISION

Plainfield, New Jersey

5M1259

quires a 60 cycle 115 V.A.C. source.

takes an input waveform and produces a standard input signal, and the triggering level is adjustable s the unit to operate over two ranges of rise times

e amplifier. Each amplifier has gain control and a

ding target of the Beam Tube. As the beam steps particular target on which the beam is formed. In

ignal across this load is fed to a cathode follower

MODES OF OPERATION

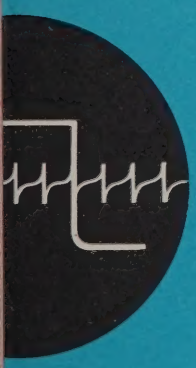
With respect to observation of the input signal there are three modes of operation of the Beamplexer:

1. *Push Button Operation.* This allows selective viewing of each channel for an indefinite period.

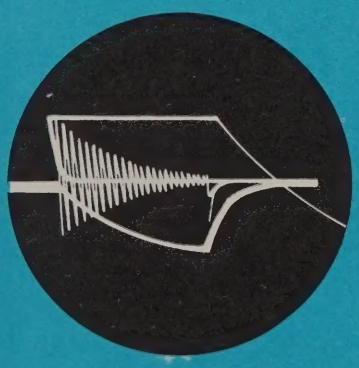
2. *Synchronizing the Switching Signal with the Data.* Whenever the data signals are related frequencywise, either by having the same frequency or by being multiples of a common frequency, it is possible to view complete cycles on each of the input lines. In this operation the synchronizing pulse from the channel with the slowest frequency is used to switch the Beamplexer. The sync pulse from the Beamplexer in turn is used to trigger the scope. In this manner it is possible to view at least one complete cycle on each of the ten channels.

3. *Sampling.* By using signals from an independent asynchronous source to switch the Beamplexer, it is possible to sample the ten input lines at rates up to 100KC. When used in this fashion, the unit acts as a chopper.

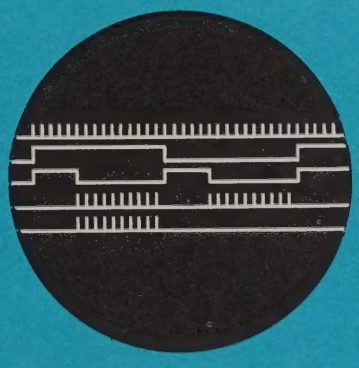
Telemetering
Multiplexing
Vibration Analysis
Servo Mechanism Phase Measurements
Neurological Studies
Internal Combustion Studies



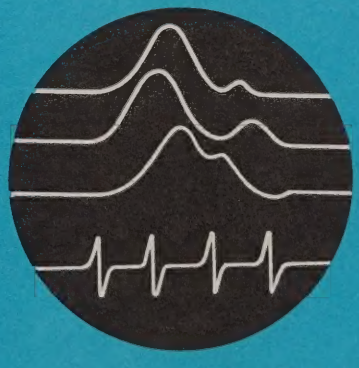
—Pulse width, requency, Delay ershoot.



Comparing—Wave shapes, Rise times, Durations and Phase Relationships.



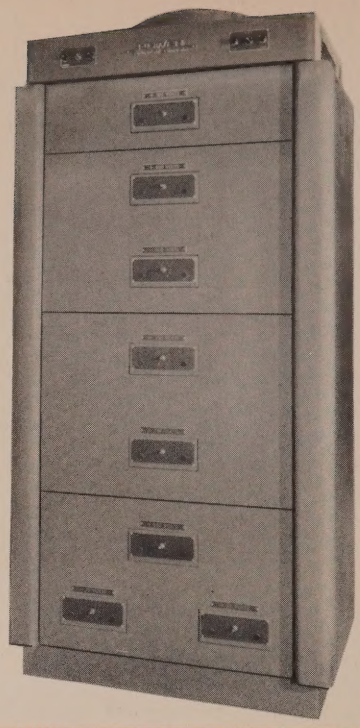
Monitoring—Related waveforms from various check points in a system.



Sampling—Unrelated waveforms from independent sources.

POWER SUPPLIES

9001



The Type 9001, the largest composite power supply in the Burroughs line, provides eight regulated d-c voltages each supplied by an independent unit. All d-c voltages can be manually adjusted ±20% from the nominal voltage. With the exception of the —15 volt and the —35 volt units, which are mounted on the same panel, each unit may be removed separately for servicing. Since all units are electrically interlocked by relays, failure, such as the loss of d-c output from any unit or the opening of a central transformer primary fuse, will cause all d-c output voltages to be removed.

Power is made available by means of a terminal strip located inside the cabinet.

Output — D-C Voltage / Current

+400	1 amp.
+250	5
+150	6
+105	3
—15	1
—35	1
—150	6
—400	1

SPECIFICATIONS

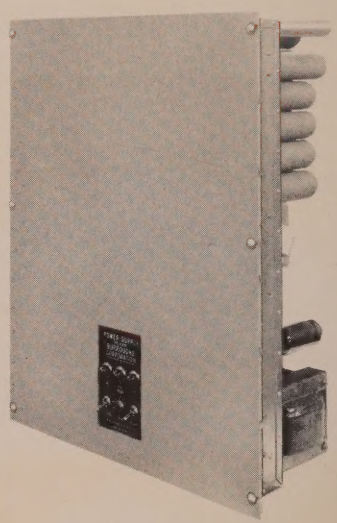
Input — 220 volts 60 Cycles Single Phase 42 amps.

Regulation — ±1% from 10% load variations, for a-c input line variations of ±8%.

Dimensions — The 9001 is mounted in a steel cabinet 35" wide x 75⅜" high x 22 1/16" deep.

Weight — 1600 lbs.

9102



The Type 9102 is a composite, regulated power supply providing seven separately controlled d-c voltages, each regulated to within 1% of its selected value. Since all units are electrically interlocked by relays, a failure in any of the output voltages will disconnect all d-c voltages. The entire unit is contained in one panel suitable for relay rack mounting, and power is made available through an Amphenol plug on either side of the unit. In addition, there are four independent 6.3 volt, 12.5 ampere heater windings available.

Output — D-C Voltage / Current

+250	500 ma
+150	500 ma
+105	500
—15	±25
—35	±25
—150	1.0 amp
—400	200
A-C Voltage	12.5 amp. (each source)
6.3 (four available)	

SPECIFICATIONS

Input — 117 VAC 60 Cycle Single Phase 12 amps. Can be adapted for 220 VAC 60 Cycle Single Phase 3 wire use.

Regulation — ±1% from 10% load variations, for a-c input line variations of ±10%.

Ripple — Less than 0.05% RMS.

Size — 19" wide x 24" high x 8¾" deep.

Mounting — Rack mounted with amateur notching.

Weight — 75 lbs.

9202

The Type 9202 is the smallest in the line of Burroughs Power Supplies. It is a composite supply which provides six d-c voltages and will drive five individual Burroughs Pulse Control units. Because of its built-in socket connections which permit power distribution without the use of power rack strips, this unit can be used with the Burroughs Bench Rack, Type 7003, or any standard 19" relay rack.

Output — D-C Voltage / Current

	Min.	Max.
+250	2 ma	150 ma
+150	30	300
+105	9	180
—15	0	15
—150	135	180
—400	10	1·5
A-C Voltage		Current
6.3		16 amp.

SPECIFICATIONS

Input — 115 VAC 60 Cycle Single Phase

Regulation — For combined line variations of 110 to 120 VAC and indicated load variations there is ±5% regulation for all output voltages.

Ripple — Less than 0.5% RMS.

Size — 19" wide x 7" high x 14" deep.

Mounting — Rack mounted with Amateur notching.

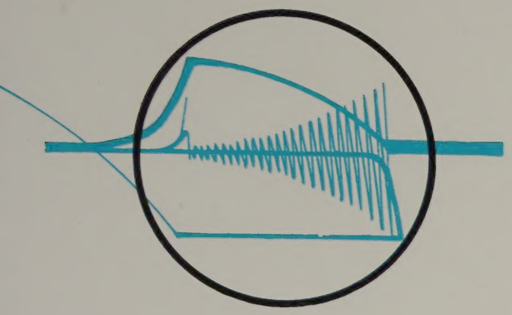
Weight — 35 lbs.

Burroughs Corporation

ELECTRONIC TUBE DIVISION

Plainfield, New Jersey

5M1259



THE BEAMPLEXER

The Beamplexer is a ten position electronic switch utilizing the Burroughs Beam Switching Tube. It provides a means of displaying up to ten separate channels of information on a conventional single-beam oscilloscope. Individual controls on each of the ten input channels allow the vertical positioning of the signals, so that they may be superimposed on each other or placed in any desired relationship. This direct visual comparison simplifies certain studies and measurements of waveshapes, phase relationships, amplitude and frequency, and increases the application and effectiveness of the oscilloscope. Available as a rack mounting unit or in an individual cabinet, the Beamplexer is a portable instrument containing its own regulated power supply. It can be used with any standard oscilloscope and will find wide application with that instrument wherever multiple switching and time sharing techniques can be employed.

OPERATION

power

The unit is equipped with a self-contained regulated power supply which requires a 60 cycle 115 V.A.C. source.

input

Switching Input: The switching section consists of a Schmitt circuit which takes an input waveform and produces a standard switching pulse. This circuit is triggered on the positive going slope of the input signal, and the triggering level is adjustable between 5 volts and 50 volts. A two position switch on the front panel allows the unit to operate over two ranges of rise times for the switching input. The output of the Schmitt circuit goes to:

A. The Trigger Out jack where it is used as a synchronizing pulse.
B. To the switching grids of the Beam Tube.

Data Input: Each of the channels is A. C. coupled to an individual triode amplifier. Each amplifier has gain control and a pedestal level control in its grid circuit.

switching

The cathode of each of the triode amplifiers is connected to a corresponding target of the Beam Tube. As the beam steps through its ten positions, current is supplied to the tube connected to the particular target on which the beam is formed. In this way only one tube at a time is allowed to conduct.

output

The triode amplifiers are tied to a common plate load resistor. The output signal across this load is fed to a cathode follower and is available through a BNC connector at the rear of the unit.

MODES OF OPERATION

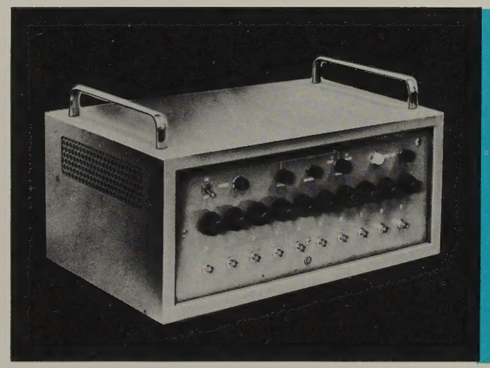
With respect to observation of the input signal there are three modes of operation of the Beamplexer:

1. ***Push Button Operation.*** This allows selective viewing of each channel for an indefinite period.

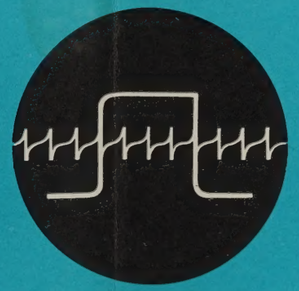
2. ***Synchronizing the Switching Signal with the Data.*** Whenever the data signals are related frequencywise, either by having the same frequency or by being multiples of a common frequency, it is possible to view complete cycles on each of the input lines. In this operation the synchronizing pulse from the channel with the slowest frequency is used to switch the Beamplexer. The sync pulse from the Beamplexer in turn is used to trigger the scope. In this manner it is possible to view at least one complete cycle on each of the ten channels.

3. ***Sampling.*** By using signals from an independent asynchronous source to switch the Beamplexer, it is possible to sample the ten input lines at rates up to 100KC. When used in this fashion, the unit acts as a chopper.

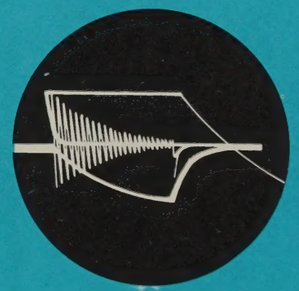
Telemetering
Multiplexing
Vibration Analysis
Servo Mechanism Phase Measurements
Neurological Studies
Internal Combustion Studies



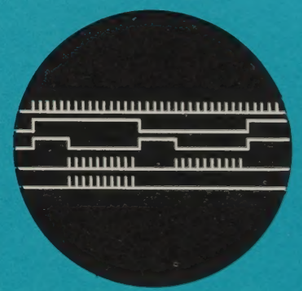
The Beamplexer—Type 6001.
Shown with case—Type 7004.



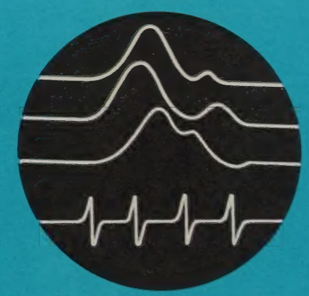
Measuring—Pulse width, Amplitude, Frequency, Delay time and Overshoot.



Comparing—Wave shapes, Rise times, Durations and Phase Relationships.



Monitoring—Related waveforms from various check points in a system.



Sampling—Unrelated waveforms from independent sources.

specifications

BEAMPLEXER TYPE 6001

SWITCHING SECTION

input: Frequency—Push Button operation and 10 cps to 100 kc.
Triggers on positive going waveforms.
Triggering level is adjustable from 5 volts to 50 volts.
Minimum pulse width—0.1 microsecond.
A push button has been provided for manual switching.

synchronizing output: Each switching signal is converted into a standard output pulse suitable for synchronizing an oscilloscope.
Width — 1.4 microseconds • Amplitude—20 volts • Polarity—Positive

reset: A push button has been provided for resetting the unit to the zero position.

DATA SECTION

channels: Number of Input Channels—10.
Number of Output Channels—1.
Signal Band Width Each Channel—10 cps to 1.0 megacycle.
Acceptable Amplitude—0.5 volts to 200 volts.

noise: Channel Noise—0.05 volts peak to peak maximum.
Cross Talk between channels—0.5 volts peak to peak maximum (at 1.0 megacycles).
Switching Transient—14 volts peak to peak maximum, 2 microseconds duration.

controls: Positioning—Individual for each channel.
Pedestal levels for each channel are adjustable over a range of ±11 volts as measured at the signal output.
Amplitude—Individual for each channel.
Maximum gain—10 db.

POWER

120 VAC, 60 cps, single phase—0.73 amps.

tube complement:

8	12AT7	1	6AH6
2	6AK5	1	5651
1	6X4	1	6700
1	6216		

connections: All input and output jacks are BNC type.

PHYSICAL CHARACTERISTICS

Height:	7	inches
Width:	19	inches
Depth:	12	inches
Weight:	20	pounds

Mounting: Amateur notching for rack mounting.

beamplexer cabinet type 7004

Height: (including handles)	10¼	inches
Width:	19¼	inches
Depth:	12½	inches
Weight:	5	pounds

tools for engineers

Burroughs

ANOTHER ELECTRONIC CONTRIBUTION BY

Burroughs Corporation

ELECTRONIC TUBE DIVISION

PLAINFIELD, NEW JERSEY